

Notice of Allowability

Application No.

10/039,596

Examiner

Zhuo H. Li

Applicant(s)

DAVID, HOWARD S.

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 3/6/2007.
2. ☒ The allowed claim(s) is/are 9, 11-12, 16-25.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some* c) ☐ None of the:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
- (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
- 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
- (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 3/2/2007
4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413), Paper No./Mail Date _____.
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____.

Information Disclosure Statement

1. The Information Disclosure Statement filed on March 2, 2007 has been considered.

EXAMINER'S STATEMENT OF REASONS FOR ALLOWANCE

2. Claims 9, 11-12, and 16-25 are allowed.

3. The following is an examiner's statement of reasons for allowance:

Applicant's invention is drawn to a distributed memory module caches system includes tag memory and associated logic implemented at the memory controller, and the data cache and associated logic are located in one or more buffer components on each of the memory modules, and further writes to a memory module are stored in the data cache which allows the writes to be postponed until the DRAM on the memory module is not busy, in order to reduce read latencies and maximizes throughput while placing a minimum burden on memory bus bandwidth (i.e., the system memory including at least two memory modules, each memory module including at least one bank of memory devices, and a memory module buffer having a data cache coupled to an eviction buffer, both coupled to the bank of memory devices, the memory module buffer including a command deserializer and decoder unit to control the data cache and the eviction buffer according to a plurality of commands delivered by the memory controller, the commands including an activate command and a write-back command).

Applicant's independent claims 9, 16, 20 and 23 each recites, *inter alia*, a system memory (210) with a structure as defined in the specification (Pp [0016] – [0029] and Pp [0034] – [0050]) including at least one memory modules (223), which comprising at least one bank of

Art Unit: 2185

memory devices, i.e., DRAM, and the memory module buffer (222) having a data cache (500) coupled to an eviction buffer (540), both coupled to the bank of memory devices, the memory module buffer including a command deserializer and decoder unit to control the data cache and the eviction buffer according to plurality of commands delivered by a memory controller over a memory bus, the commands sequentially delivered over a plurality of transfer periods of a memory access transaction, the plurality of commands including an activate command and a write-back commands, the command deserializer and decoder unit to receive a write-back command, the command deserializer and decoder unit to cause a previous line of data, evicted from the data cache and stored within the eviction buffer. Applicant's independent claims 9, 16, 20 and 23 each recites comprise a particular combination of elements, which is neither taught nor suggested by the prior art.

Accordingly, Applicant's claims are allowed for these reasons, and for the reasons recited in the previous Amendments and Remarks.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

4. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Zhuo H. Li whose telephone number is 571-272-4183. The examiner can normally be reached on Mon - Fri 10:00am - 6:30pm..

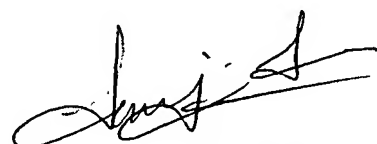
Art Unit: 2185

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on 571-272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

5. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Zhuo H. Li

Patent Examiner
March 21, 2007



SANJIV SHAH
SUPERVISORY PATENT EXAMINER
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